

### 3.0 PROPOSED ACTION

#### 3.1 OPERATION AND CONFIGURATION OF THE FCRPS AND BOR PROJECTS

The Action Agencies have proposed, as described in their Biological Assessment (BA) (BPA et al. 1999), to continue current operations of the FCRPS implementing the 1995 Biological Opinion's RPA as supplemented, while developing measurable performance standards to guide future system improvements.

The FCRPS is currently operated to serve an array of individual project and system purposes. Individual project purposes vary widely and may include power generation, flood control, irrigation, recreation, fish and wildlife and other purposes defined by their congressional authorizations. Systemwide purposes focus on supplying electrical energy to meet existing and projected loads, flood control, and more recently, salmon recovery.

In addition to those BOR projects included within the FCRPS (e.g., certain facilities and operations at the Grand Coulee Project and Hungry Horse Dam and Reservoir), the Action Agencies propose to continue current operations of BOR's other projects as described in the BA.

Elements of the proposed action designed to enhance salmon survival are described in the following sections.

#### 3.2 OBJECTIVES FOR SALMON AND STEELHEAD

The Action Agencies recommend that mainstem flow operations be based on the 1995 RPA as supplemented by the 1998 Biological Opinion. For SR salmon and steelhead, the seasonal average flow objectives would range from 85 to 100 kcfs during spring (April 3 to June 20) and 50 to 55 kcfs during summer (June 21 to August 31) at Lower Granite Dam. Flow objectives in the lower Columbia River, as measured at McNary Dam, would range from 220 to 260 kcfs during spring (April 20 to June 30) and 200 kcfs during summer (July 1 to August 31). The flow objectives in any given year would be determined using a sliding scale based on forecasted runoff, as specified in the 1995 RPA. To benefit UCR steelhead, in the mid-Columbia reach the 1998 Supplemental FCRPS Biological Opinion set a further spring flow objective of 135 kcfs (April 10 to June 30) at Priest Rapids Dam.

System operators will continue to confer with NMFS and the regional fisheries comanagers to determine how to best manage in-season conditions relative to the seasonal average flow objectives. Flow management would continue to emphasize refill of headwater storage projects by June 30 in the Snake River basin and by the end of the July 4 weekend in the Columbia River basin each year, although that priority would remain subject to in-season considerations. Reservoir drafts would be limited to 80 feet at Dworshak (elevation 1,520 feet), 10 feet at Grand Coulee (elevation 1,280 feet), 20 feet at Hungry Horse (elevation 3,540 feet) and 20 feet at Libby (elevation 2,439 feet).

For fall chinook and chum salmon spawning below Bonneville Dam, the FCRPS would be operated to use storage to augment natural flows, in an attempt to provide a flow level of 125 kcfs during early November through early April while maintaining the 1995 RPA requirement for storage projects to be at their upper (flood control) rule curve elevation on April 10 of each year. The Action Agencies recognize that in some years it may be impossible to meet both these flows and the reservoir levels in the spring, in which case priority will be on refill. As natural conditions permit, a conservative step-wise approach would allow higher flows during late fall and early winter (i.e., providing additional spawning habitat in the Ives Island area). If in-season data on reservoir operations indicate that the 1995 RPA, the 1998 Supplemental FCRPS Biological Opinion, and Vernita Bar flow requirements cannot be met by providing chum flows, the Action Agencies will confer with NMFS to modify operations.

### **3.2.1 Water Quality**

The Action Agencies propose to continue to operate the FCRPS to reduce water temperatures during periods of juvenile and adult fish migration and to reduce the harmful effects of elevated levels of spill-generated total dissolved gas (TDG) on anadromous and resident fish. Based on recommendations by the TMT, flows would be released from Dworshak Dam to help reduce water temperatures in the lower Snake River for migrating fall chinook salmon and steelhead. Gas concentrations would be controlled by limiting the amount of spill at mainstem dams and by installing gas abatement structures that reduce the generation of TDG.

### **3.2.2 Specific Project Operations**

#### **3.2.2.1 Libby**

Libby Reservoir would be maintained throughout fall and winter to achieve a 75% chance of reaching flood control elevation on April 10. Between April 10 and July, the Action Agencies would release water to achieve the goals set for white sturgeon in the Kootenai River. If the elevation of Lake Koocanusa is above 2,439 feet at the conclusion of the sturgeon operations, the Action Agencies would use water above elevation 2,439 feet to provide flows to meet salmon objectives within the turbine capacity of Libby Dam. Efforts would be made to minimize the effect of a second peak flow fluctuation below Libby until August 31 for the benefit of resident fish species. The Action Agencies would consider the TMT's recommendations for Libby operations, along with others (including the Northwest Power Planning Council's) in making final operating decisions.

#### **3.2.2.2 Hungry Horse**

Hungry Horse Dam would be operated during the fall and winter months to achieve a 75% chance of refill to its April 10 Upper Rule Curve. Hungry Horse Dam would also operate to meet a year-round minimum instantaneous streamflow of 3,500 cfs in the Flathead River near Columbia Falls to protect instream habitat for native resident fish populations, including ESA-listed bull trout. Using water supply forecasts, the Action Agencies would operate the project to refill no later than the end of the July 4 weekend. The Action Agencies would draft the project to 3,540 feet to assist in meeting the summer anadromous fish flow objective at McNary Dam, as coordinated through the TMT. Because a selective-withdrawal water temperature control structure has been installed at Hungry Horse, the Action Agencies would plan water releases to try to meet state-recommended water temperature guidelines during the period June through October.

### **3.2.2.3 Grand Coulee**

Grand Coulee Dam would be operated according to the 1995 RPA and the 1998 Supplemental Biological Opinion. The Action Agencies would operate the project during January through April 10 to ensure an 85% confidence of refill to flood control elevation. The BOR would limit winter drafts to elevation 1,265, 1,260 feet, 1,250 feet, and 1,240 feet at the end of December, January, February, and March, respectively (except when deeper drafts would be needed for flood control or power emergencies). Beginning in April, Grand Coulee would be operated to refill to full pool (elevation 1,290 feet) by the end of the July 4 weekend. From April 10 through August 31 of each year, releases would be made to augment flows for anadromous fish, as coordinated by the TMT. The reservoir would be drafted as low as 1,280 feet elevation by August 31 during average and above-average water conditions. Following Labor Day weekend, the Action Agencies would try to refill Lake Roosevelt by the end of September to elevation 1,283 feet or higher for kokanee spawning needs. Water would also be released from Grand Coulee to meet an average daily minimum flow requirement of approximately 30 kcfs or higher as needed to meet minimum flows at Priest Rapids Dam. The Priest Rapids minimum flow is the higher of 36 kcfs or the Vernita Bar flow requirement during the December through May period. The Action Agencies would continue to coordinate with regional interests to develop operations that minimize the potential stranding of post-emergent fall chinook in the Hanford Reach.

### **3.2.2.4 Albeni Falls**

The typical maximum reservoir operating range for this project, which controls water surface elevations in an upstream natural lake, is from elevation 2,051 to 2,062.5 feet. The reservoir would be drawn down beginning on Labor Day for power generation and flood control purposes and would typically achieve its lowest elevation between November 15 and 20 of each year. Variations in lake level after November 20 would be controlled to within 1 foot to protect established kokanee spawning areas. Experimental operations have occurred for the last several winters to examine the relationship between winter lake levels and kokanee spawning. During winter 2000, a lake elevation of 2,053 feet was monitored to evaluate potential effects on resident species and lake productivity. Before this experimental operation, Albeni Falls was drafted further, to elevation 2,051 feet, during winter operations. Under the Action Agencies'

current action, operations during January through March 31 would allow for some fluctuation in reservoir elevations for power production, but the elevation could not drop below the last minimum water level established in December. From April through June, the reservoir would refill. During the summer months, the fluctuations would be maintained within a 0.5-foot limit (i.e., between 2,062 and 2,062.5 feet elevation).

### **3.2.2.5 Dworshak**

Dworshak Dam would continue to be used to augment flows in the Snake River for the intended benefit of juvenile and adult summer-migrating salmon and steelhead from April through August. Dworshak would be full by June 30 and would draft to its August 31 draft limit of elevation 1,520 feet (80 feet from full pool) to provide water to meet anadromous fish flow objectives. The project would be operated to release a minimum of 1,300 cfs between September and April to enhance the probability of refill to the flood control rule curve elevation by the beginning of April. Because Dworshak Dam has a temperature control outlet facility and a multi-level outlet, cool water would typically be released during July or August to reduce water temperatures in the lower Snake River.

### **3.2.2.6 Upper Snake/Brownlee**

The BOR proposes to continue providing 427 kaf of water from the upper Snake River basin to benefit flow conditions during the juvenile salmon outmigration season (April through August) and to continue seeking additional water for this purpose. Termed “flow augmentation” this effort has evolved since its inception in the late 1980s (NMFS 1999). The current commitment was identified in RPA 1 of the 1995 Biological Opinion and adopted by BOR in its record of decision issued on March 10, 1995. The State of Idaho enacted legislation (Idaho Code § 42-1763B) to grant BOR access to existing water banks for the purpose of acquiring annual leases of storage space needed to meet this obligation.

To provide this water, the BOR has reacquired some 60,000 acre-feet of reservoir storage space in its upper Snake River basin reservoirs and has assigned about 100,000 acre-feet of previously unassigned space to flow augmentation. The BOR has also leased 38,000 acre-feet of storage space in Palisades Reservoir as part of a 5-year agreement with the Shoshone Bannock Tribes of the Fort Hall Indian Reservation and has acquired 17,650 acre-feet of natural flow rights in Oregon for flow augmentation. The BOR proposes to acquire any remaining water needed to meet the 427 kaf goal from willing lessors in Idaho’s water banks. Using this strategy, the BOR has successfully provided about 427 kaf annually from upper Snake River basin reservoirs and natural flow rights since 1993.

While the BOR has been able to meet its commitment to provide this amount since 1993, hydrologic conditions and legal and institutional impediments limit the surety that this amount could be provided in all years (NMFS 1999). To improve this surety, BOR has committed to

using available powerhead space <sup>1</sup> in several of its reservoirs in the event that it would be unable to provide 427 kaf without this extraordinary measure.

Under an agreement between BPA and Idaho Power Company, IPC shapes the upper Snake River spring and summer releases at Brownlee.<sup>2</sup> IPC also has agreement with the Payette River Watershed Council to shape winter releases from the Payette River into the summer by drafting Brownlee Reservoir.

The BOR proposes to use BOR space, rentals from the state water bank, Shoshone Bannock water rental bank, powerhead space, existing state water law mechanisms, and ongoing negotiations with the stakeholders to provide 427 kaf of flow augmentation.

### **3.2.2.7 Columbia River Treaty and Non-Treaty Storage**

The Corps and BPA propose to continue to negotiate mutually beneficial agreements with B.C. Hydro annually for use of their Columbia River Treaty storage and Non-Treaty storage in Canada to improve the likelihood of achieving salmon flow objectives in the mainstem Columbia River. Under Treaty operations, these actions include (1) one million acre-feet of storage for salmon flow augmentation in the Columbia River, stored above the Detailed Operating Plan Treaty Storage Regulation levels from January to April 15 and then released from May through July, and (2) storage exchanges between Libby and Canadian reservoirs, which would reduce potential adverse effects of salmon flow augmentation drafts on recreation, resident fish, and power in the U.S. and Canada. Under the Non-Treaty Storage Agreement, both BPA and B.C. Hydro store water in Mica Reservoir during May and June for release in July and August. BPA releases all of its May/June stored water during July and August for salmon flows, whereas Canada releases one-half of its May/June stored water during July and August and the other half at its discretion.

### **3.2.3 Spill for Fish Passage**

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<sup>1</sup> Powerhead space is the water stored in a reservoir for the purpose of providing the hydraulic head (depth) needed for hydroelectric turbines to operate properly. Without adequate powerhead, a project's powerhouse would need to be shut down. At some projects, powerhead provides the necessary reservoir elevation for water diversions pursuant to state law. Idaho and stakeholders in BOR's projects have disputed the legality of using powerhead space for flow augmentation. NMFS and the BOR consider powerhead water to be legally available for flow augmentation and will continue to rely on it as necessary.

<sup>2</sup> IPC releases water from storage at Brownlee in advance and anticipation of water deliveries from the BOR's upper Snake River projects. The agreement provides for an energy exchange to compensate IPC for generation losses incurred by this water shaping activity.

Spill is an action provided to reduce turbine-related mortality of juvenile salmon and steelhead at lower Snake and Columbia River hydroelectric projects. Spill will be at the levels recommended in the 1998 Supplemental Biological Opinion, assuming that waivers are obtained from the states of Oregon and Washington to exceed their 110% TDG state water quality standards. The Action Agencies would continue to provide spill for fish passage, but not to exceed TDG levels allowed under the standard, or modification thereof.

### 3.2.4 Juvenile Fish Transportation

Juvenile salmonids would be collected at several dams on the lower Snake and Columbia rivers and transported downstream by truck or barge to release points below Bonneville Dam in an effort to improve survival over that experienced by inriver migrants. The Action Agencies would continue to provide spill levels that spread the risk between transported and inriver migrants. Spring migrants would not be transported from McNary Dam. Generally, summer juvenile migrants (those collected after the June 20 planning date) would be transported from all four transport facilities; spill would be limited during this period so that a greater proportion of the run approaches the power house and is diverted by screens into collection facilities. Once collected, nearly all would be transported by barge or truck to below Bonneville Dam and released.

### 3.2.5 Minimum Operating Pool (MOP)

Some mainstem run-of-river FCRPS reservoirs on the lower Snake River and John Day Reservoir on the Columbia River would be lowered during the spring and summer migration periods to increase water velocity (intended to increase the migration rate and survival of salmonid smolts). Three of the lower Snake River facilities (Little Goose, Lower Monumental, and Ice Harbor dams) would be operated within 1 foot of MOP from April 3 until adult fall chinook begin to enter the Snake River, as recommended by the TMT. Lower Granite Dam would be operated within 1 foot of MOP from April 3 through November 15 of each year. After November 15, all four reservoirs would be operated within their normal 5-foot operating ranges. McNary, The Dalles, and Bonneville dams would be operated within their normal ranges. From April 20 to September 30 each year, John Day would be operated within a 1.5-foot range above elevation 262.5 feet as long as irrigation withdrawal remains unaffected and additional space is not needed for flood control. The pool elevation would be raised if irrigation pumping problems occur.<sup>3</sup> During the fall and winter months, all four lower Columbia River projects would be operated within their normal operating range, with the exception of temporary flood control storage at John Day, if needed.

### 3.2.6 Peak Turbine Efficiency Operation

Under the current action, the Action Agencies would operate turbines at the eight FCRPS mainstem Snake and Columbia River projects at a high efficiency (within 1% peak operating

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<sup>3</sup> It has been determined that John Day Reservoir can not be operated at its MOP elevation of 257 feet during the juvenile fish migration season due to adverse effects on irrigation pumping.

efficiency) to reduce the mortality of fish passing through turbines. Operations outside this range would be limited and most likely implemented at the recommendation of TMT for the purpose of abating supersaturated levels of dissolved gas. Specifics of turbine operations that would achieve 1% efficiency are contained in the Corps' annual Fish Passage Plan (FPP).

### **3.2.7 Fish Passage Facilities**

#### **3.2.7.1 Juvenile Fish Bypass**

Juvenile fish bypass would be provided at Corps mainstem hydroelectric projects by a variety of methods, including screened turbine intakes with bypass/collection facilities at Lower Granite, Little Goose, Ice Harbor, Lower Monumental, McNary, John Day and Bonneville dams; ice and trash sluiceway passage at The Dalles Dam; and/or spill for fish passage. Surface bypass technology is under evaluation at Lower Granite, Bonneville and John Day dams. Juvenile fish bypass facilities would be operated continuously during the fish passage period from April through November. All juvenile fish bypass systems would be operated and maintained based on criteria in the Corps' FPP. The FPP would be reviewed and updated annually after coordination with the regional fisheries agencies and Indian Tribes and in coordination with NMFS. In-season changes to operating criteria and maintenance schedules may be recommended by the TMT.

#### **3.2.7.2 Adult Fish Passage**

All the mainstem FCRPS hydroelectric dams in the Columbia/Snake migration corridor have fish ladders and associated auxiliary water supply and powerhouse collection facilities. The adult fish passage period would be March through November at Bonneville, The Dalles, and John Day dams and March through December at McNary and the four lower Snake River projects. Criteria for the operation and maintenance of adult passage facilities would be also contained in the Corps' FPP. Adult salmonids (and other species) would be counted at each mainstem dam, with the schedule varying according to location and time of year.

### **3.2.8 Other Activities**

A number of research studies covering various aspects of juvenile and adult fish passage would be implemented annually based on provisions in NMFS' biological opinions and through coordination with regional work groups. These studies would be intended to provide information related to key passage uncertainties, for improving operational criteria, modifying/improving existing fish passage facilities, and constructing new passage facilities. Research activities would continue as needed and coordinated with regional forums.

### **3.2.9 Predator Control Program**

The Northern Pikeminnow Management Program, designed to substantially reduce predation losses of juvenile outmigrants, would continue. The program includes harvest technology research, prey protection measures, basic biological research, and a bounty- or sport-reward

fishery to encourage the public to harvest northern pikeminnows. Caspian terns have also been identified as a major predator on juvenile salmonids, particularly in the Columbia River estuary near Rice Island. The Action Agencies would also continue to conduct studies to determine the significance of predation by fishes and birds throughout the FCRPS and to identify measures to reduce juvenile salmonid losses to these predators. This may include expansion of those activities that are already underway (e.g., avian lines, water cannons), as well as initiation of new measures that are likely to be effective.

### **3.2.10 Adaptive Management Framework Through Adoption of Performance Measures**

The Action Agencies' BA focuses on establishing a course of action for the FCRPS that avoids jeopardy and facilitates the future recovery of listed stocks. Avoidance of jeopardy and facilitation of recovery necessarily requires that the Action Agencies consider actions and improvements in the hydrosystem in connection with actions and improvements expected for other Hs, e.g., habitat, harvest, and hatcheries. Specific actions identified above would provide the base for future operations and actions in the hydrosystem, subject to adjustment over time. The BA also outlines a proposed "Construct for Achieving Survival Improvements" (Construct) that would establish measurable biological performance standards for the hydrosystem, prioritize actions, and estimate the likely outcome of future actions. The Construct would provide a basis for some experimental management actions to improve understanding of key uncertainties and thus the ability to implement future actions to achieve recovery.

Future long-term actions identified or evaluated in the BA as potentially of benefit to listed species include ongoing studies evaluating the feasibility of lower Snake River actions, such as dam breaching, and the John Day Phase I report that addresses juvenile fish passage alternatives. A variety of actions under consideration to improve dissolved gas and temperature conditions for the benefit of anadromous and resident species are also described as well as various system modifications including new turbine designs, surface bypass/collectors, and improved transport facilities. Changes in storage project operations and configurations in the Snake and lower Columbia rivers for the benefit of anadromous and resident fish (e.g., gas abatement and increased flow augmentation) are also described.

The Action Agencies' Construct is premised on establishing an overall recovery goal. It would provide a method of defining desired levels of improvement in each of the Hs, developing performance standards associated with these levels of improvement, evaluating and setting priorities for possible actions in each H, and selecting the most appropriate combination of actions in each H. The Action Agencies propose to use this method to evaluate possible future hydro actions, recognizing that overall recovery goals and associated obligations for survival improvements among all the Hs may not be established within the timeframe of the FCRPS consultation. Accordingly, the Action Agencies recommend that interim performance standards be developed during consultation to enhance decision-making and to provide a model for developing performance standards for all Hs.

### **3.3 ISSUANCE OF SECTION 10 PERMIT FOR JUVENILE FISH TRANSPORTATION PROGRAM BY NMFS**

During 1999, the Corps' Walla Walla District applied to NMFS for a new Section 10 permit for the Juvenile Fish Transportation Program (JFT). As an interim measure, NMFS extended the Corps' existing Permit 895 under authority of Section 10 of the ESA and NMFS regulations governing ESA-listed fish and wildlife permits (50 CFR parts 217 through 227). The extended permit is valid until December 31, 2000, or until replaced by the new permit. The Corps is conducting a feasibility study, in conjunction with this consultation, to evaluate several alternatives to juvenile fish transportation. The extension of Permit 895 allows the duration of the permit to coincide with this re-initiation of ESA Section 7 consultation on the long-term management strategy for the FCRPS. Permit 895 authorizes the Corps' annual direct takes of juvenile endangered SR sockeye salmon, juvenile threatened SR spring/summer chinook salmon (naturally produced and artificially propagated), juvenile threatened SR fall chinook salmon, and juvenile endangered UCR steelhead (naturally produced and artificially propagated). All of these are associated with the Corps' juvenile fish transportation program at four hydroelectric projects on the Snake and Columbia Rivers (Lower Granite, Little Goose, Lower Monumental, and McNary). Permit 895 also authorizes the Corps' annual incidental takes of ESA-listed adult fish associated with fallbacks through the juvenile fish bypass systems at the four dams. With regard to the Corps' request to include an annual take of adult and juvenile endangered UCR spring chinook salmon, NMFS determined that any take of this species associated with the Corps' transportation activities would be incidental under the existing requirement to suspend transportation operations from McNary Dam during the spring migration period.